Will there be a “Wende” of the “Energiewende”?

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German “Energiewende” (energy transition) is under discussion

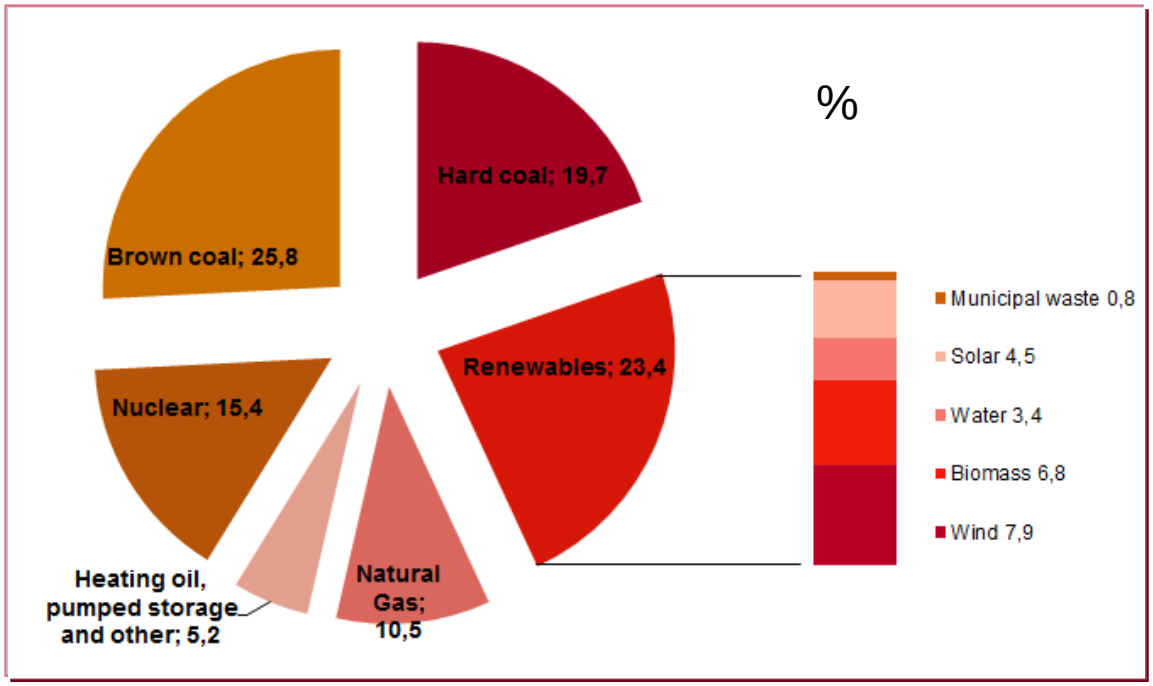
The German Energiewende is based on various pillars. Most prominent:

- **Phase out of nuclear power**
  -> Nuclear power generation in Germany will end in 2022

- **Increased share of renewables (RES-E)**
  -> The growth of RES-E in power generation is a success, but comes at a price. Cost of RES-E (“EEG-Umlage”) is a significant element to end customer bills and RES-E infeeds (will) force the power system to adapt. What are the issues?

- **Discussion about capacity markets (CM)**
  -> Some big countries (UK, FR, IT) have/introduce CM. In Germany part of the coalition paper. What could it mean for gas?

The Renewables have “grown up”…



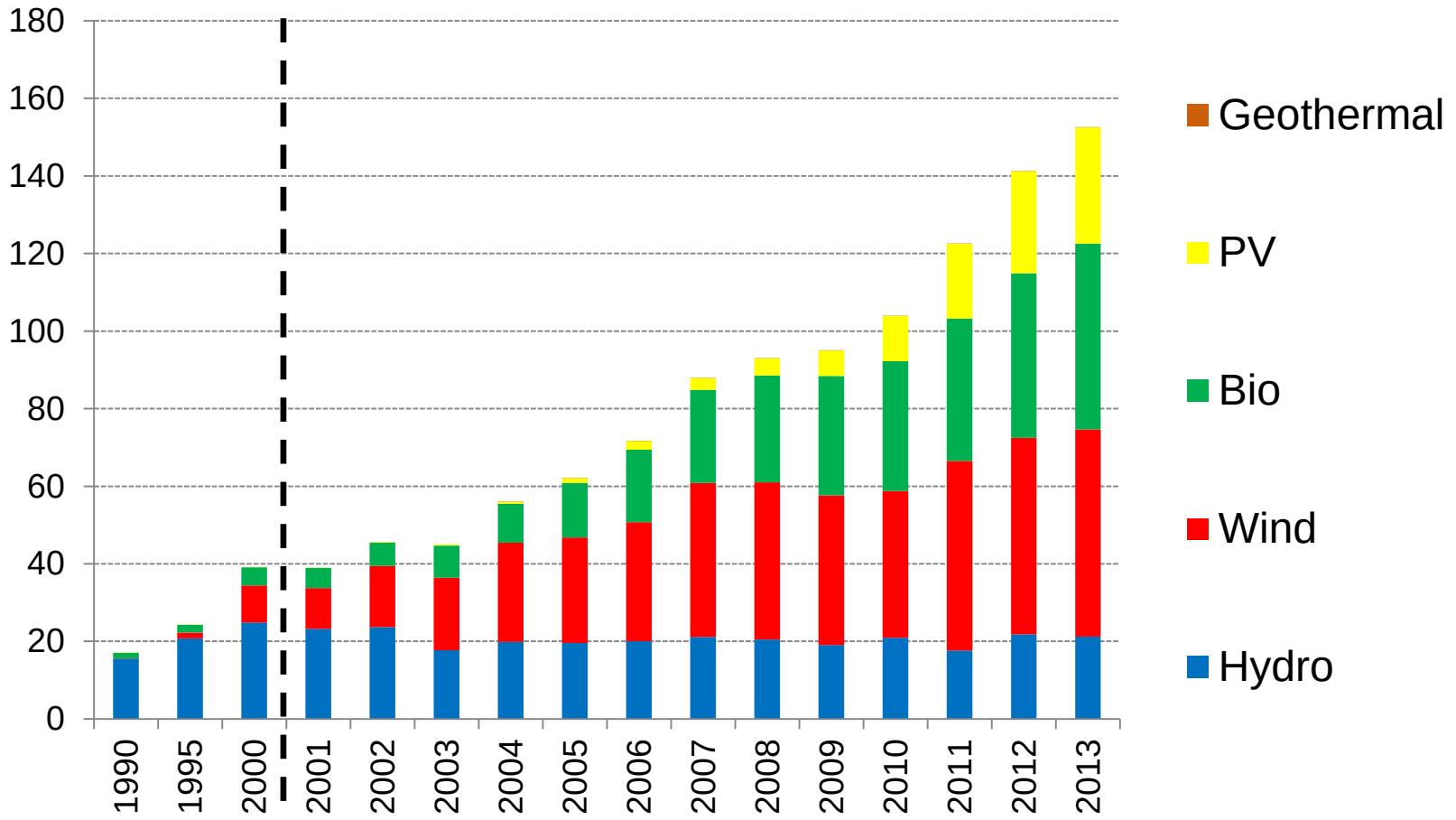
In 2013 EEG secured a share of more than 23% of renewable energy on electricity production in Germany.

Total: (629 TWh)

- Cost efficiency? Net-subsidies reached 16,2 billion Euro in 2013
- Control of capacity expansion? Four record-years for solar in a row: **over 26 GW since 2009**
- Network expansion? Increasing necessity of feed-in management
- Technology development? Expensive solar learning curve, delay in offshore-wind

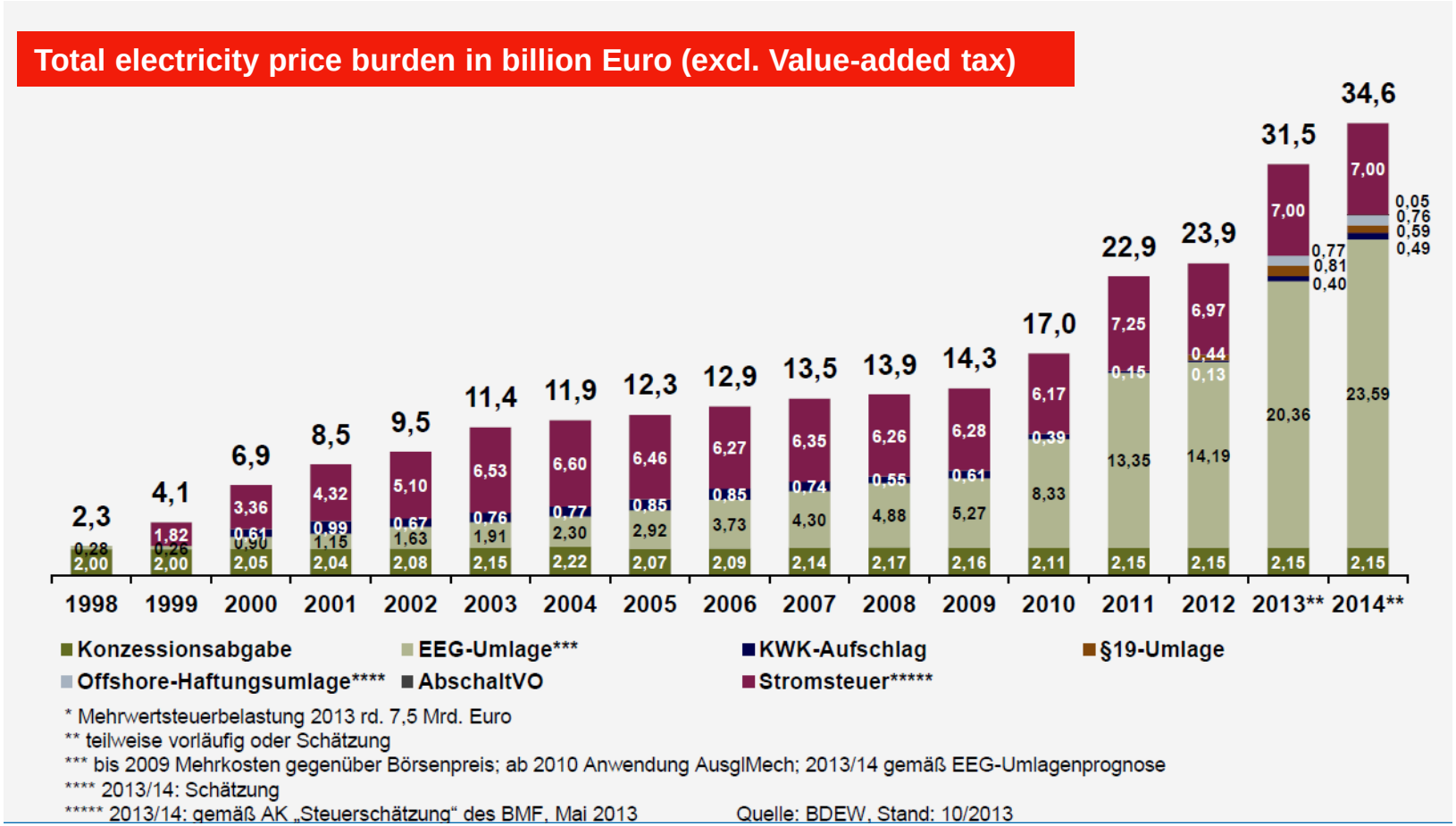
The Renewables have “grown up”

Generation in TWh in Germany

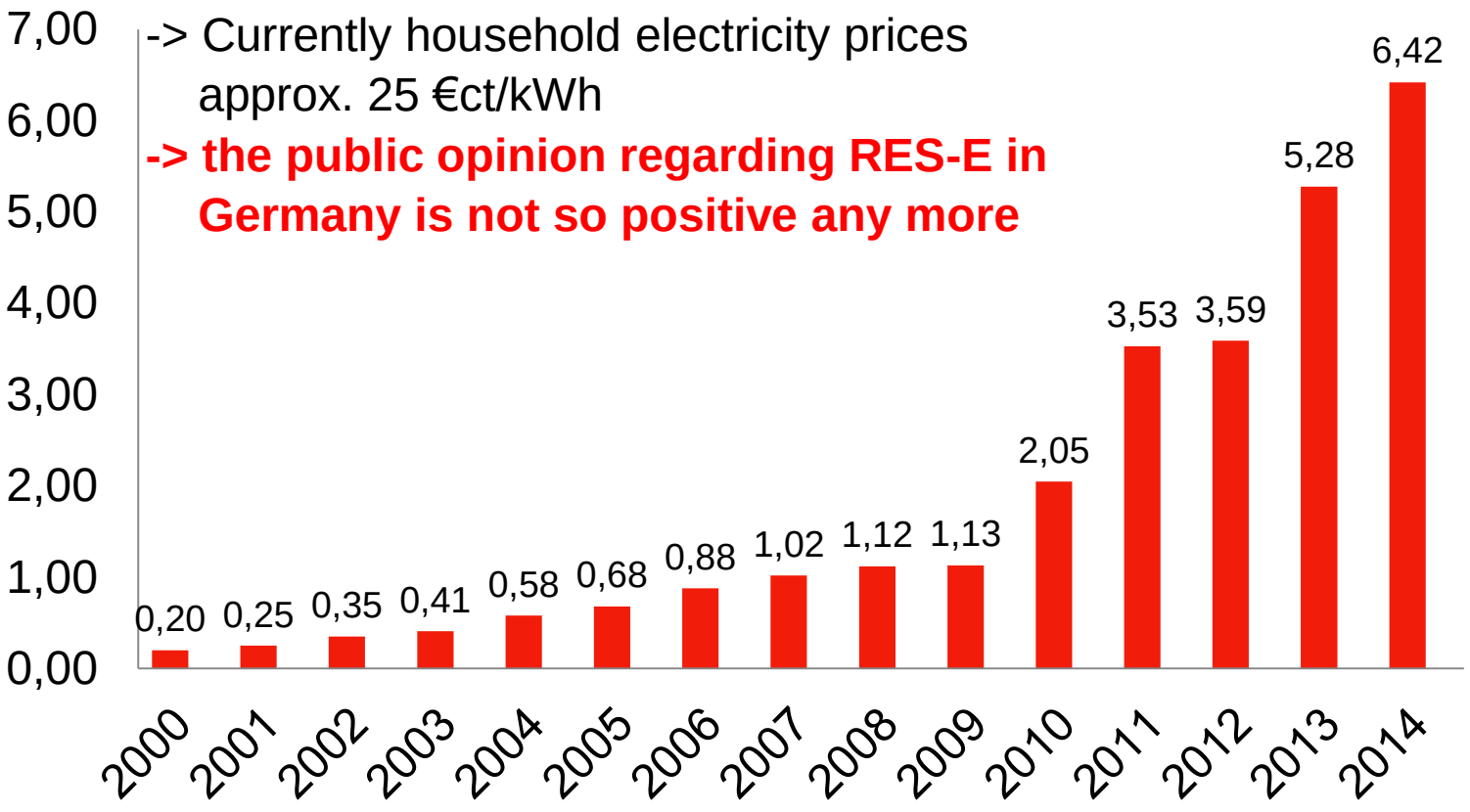


Source: Various

… so has the total tax and levy burden („EEG“)

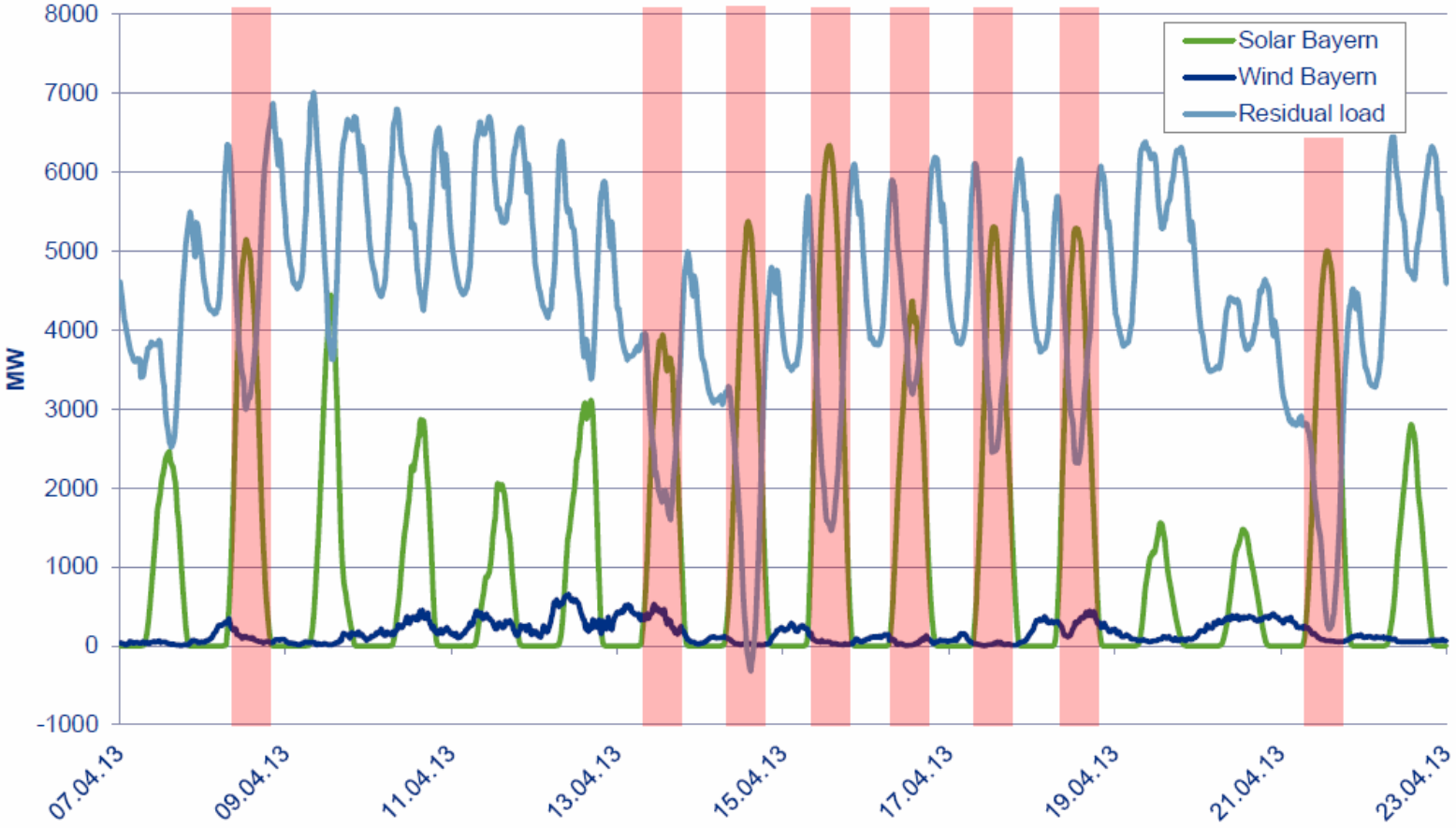


Increase of EEG-Apportionment in €-ct/kWh



Source: www.eeg-kwk.net

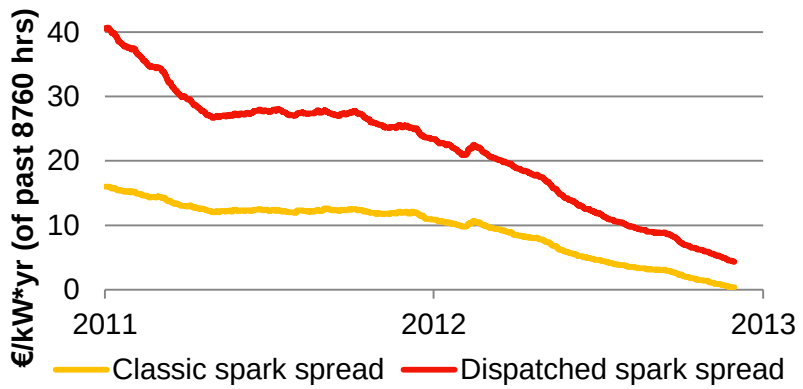
In some German states RES-E infeed exceeds the load already today: Example Bavaria



Source: Martin Fuchs CEO, TenneT TSO GmbH, The Energiewende,
Challenges and Requirements for a Secure Electricity Supply in the View of a TSO

Increased RES also impacts the dispatch – mainly of gas-fired generation

Strong deterioration of gas plant economics: Rolling "contribution margin" of past 8760 hrs



- CCGTs not dispatched when spreads negative
- Dispatched spark spreads take this into account, unlike classic spark spreads
- Dispatched spark spreads have fallen even more than classic spark spreads
- CCGTs certainly not earning their cost of capital, in fact barely earning their fixed costs

Thursday, 07 March 2013

FEATURED

German utilities to decide on mothballing Irsching-5 on March 30

Siemens-build Irsching-5 power plant unit

The owners of the 840 megawatt Irsching 5 power plant in Bavaria – E.ON, N-Ergie, Mainova and HSE – will convene on April 30 to decide whether to mothball the plant. "We are sticking to our agreement to keep the plant operational until the end of March, but operating the plant is not profitable at current low wholesale power prices and reduced run-time hours," an E.ON spokeswoman told *Gas to Power Journal*.

Source: E.ON

Different capacity market designs are in discussion. A ticket system could be a good solution

Producer

Market

Distributors/ Balance responsible

Generation and provision of a guaranteed capacity in case of a shortage[1].

Guaranteed capacity will be traded on the stock exchange in form of the standardized certificates

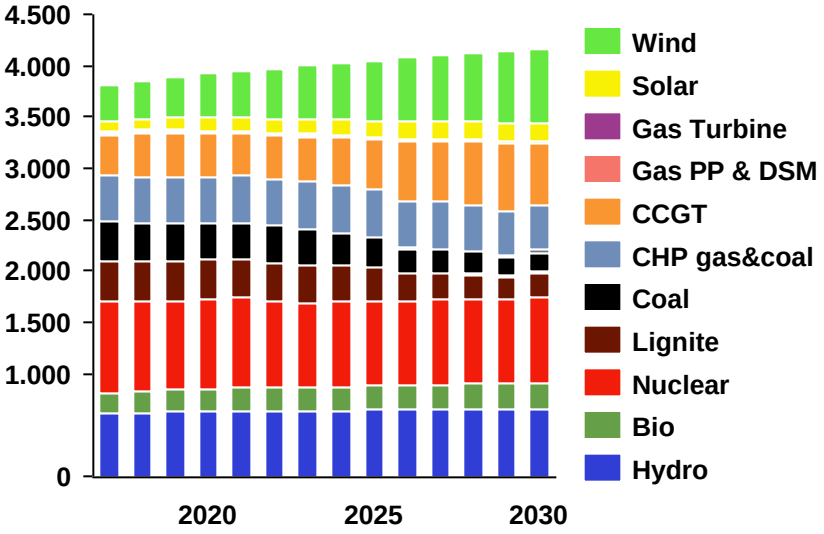
Distributors buy these certificates and get the right, to obtain power in case of a shortage.

- The amount of the required certificates can be reduced through individual agreements upon load shedding between distributor and customer.
- Controlled fines: if in case of a shortage less certificates were procured than required for the load, i.e. less capacity is offered or produced than obtained through the purchase of certificates, fines have to be paid.

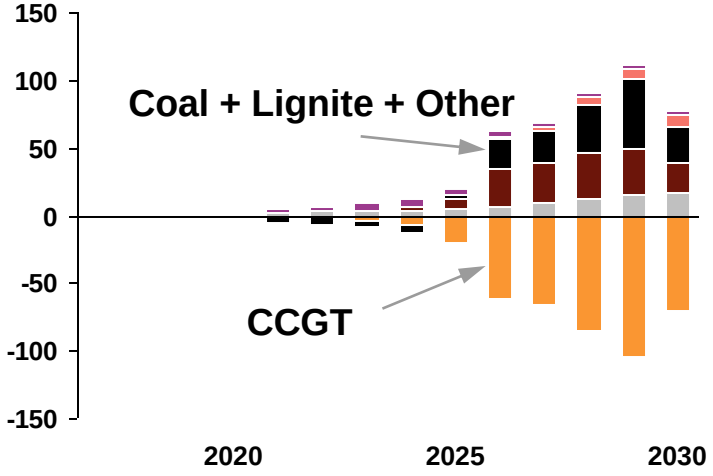
[1]Shortage means a situation in which the electricity price is higher than a certain price on the Day Ahead Market. Other and complementary definitions are possible.

Effect of capacity markets on the generation mix in Europe*: Growth of gas to power possibly impacted

Generation Mix in Europe* [TWh]



…compared to Energy Only [TWh]



- As soon as new capacity is needed, in a capacity market the cheapest new build option will be added. In contrast to todays Energy only Market design, **this is the open cycle gas turbine (OCGT).**
- Mid-/Long-term impact for gas: the growth in gas to power could be lower than expected today in many analyses, as OCGT hardly gets dispatched.
- But: The EU-wide introduction of capacity markets is uncertain and other fuel- and carbon scenarios are possible, too.

*incl. Turkey